APPENDIX B SITE DEFINITION AND MAPPING

APPENDIX B

1. INTRODUCTION

The Portsmouth Gaseous Diffusion Plant (PORTS) is a federally owned facility operated by the United States Enrichment Corporation (USEC) and the United States Department of Energy (DOE). PORTS separates uranium isotopes through gaseous diffusion to enrich uranium for commercial nuclear reactors. In October 1992, Congress passed the Energy Policy Act and established USEC. In accordance with the Act, USEC leases and operates the uranium enrichment facilities at PORTS. DOE's primary role at PORTS is oversight of environmental restoration and waste management activities.

The 3714 acre (1503 ha) federal reservation lies in Pike County, Ohio, between the cities of Chillicothe and Portsmouth and is approximately 70 miles south of Columbus, Ohio. The plant is located approximately 4 miles southeast of the village of Piketon, Ohio, 1.5 miles east of U.S. Route 23 and 2 miles south of State Route 32.

This appendix provides existing mapping and associated data for the proposed Depleted Uranium Hexafluoride (DUF₆) site. This site is located in the west central portion of the facility and encompasses approximately 28 acres. The site has currently existing three structures; the X-744S Building, the X-744T Building, and the X-744U Building.

These warehouses were originally erected in the early 1950s to support construction of the Gaseous Diffusion Plant. Goodyear Atomic used these facilities for storage of seasonal and seldom used equipment and material until the early 1960s when the decision was made by the Atomic Energy Commission to store spent lithium salts in these warehouses. Due to construction of the GCEP project, these warehouses were relocated in 1978 to their current location. These warehouses have four-in. concrete floors. New siding and roofing was installed during the relocation. The structure is steel and is what is now commonly sited as a "pre-engineered steel building." The roofs of the warehouses were coated with an exterior urethane coating. No utilities are functional in these buildings.

The open field site north and east of the X-744S, X-744T, &- X-744U Buildings proposed for use was rough graded several times with the latest being in the late 1970s at the time period. The site was been rough graded with storm water ditch systems installed. Two railroad spurs existed at one time in this area. One has had track and ties removed. The other has fallen into disrepair. This spur can be upgraded and does connect to the existing site rail infrastructure.

Currently available mapping of the site is contained in successive sections of this appendix. The mapping and associated data shows underground improvements and utilities, as built site topographic conditions, existing buildings, and general layout of the site and its relation to the remainder of the PORTS plant. Photographs of the site are also included in this section.

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Section 2.0, Excavation/Penetration/Geophysics Report

1.GEOPHYSICAL INVESTIGATION AT PROPOSED DEPLETED URANIUM HEXAFLUORIDE CONVERSION FACILITY PORTSMOUTH GASEOUS DIFFUSION PLANT, PORTSMOUTH, OHIO ALTERNATE SITE

1.1INTRODUCTION

Geophysical methods were used (August 2 through 4, 2000) to investigate the presence of underground utilities at six boring locations at the alternate site for the proposed Depleted Uranium Hexafluoride Conversion Facility at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio. This site is located in the west-central portion of the Plant. The site is referred to as the "Lithium Warehouse Site" because the buildings on/adjacent to the site were once used for storing containerized lithium. The buildings are now empty. The remainder of the proposed site is a relatively flat grassy field. Ground penetrating radar (GPR) and electromagnetic (EM) metal detection (EM61) techniques were used at each location.

The instruments used for this project use remote sensing methods that rely on the presence of contrasts in the physical characteristics of the target and the surrounding material. The EM and GPR devices can only detect targets such as buried pipes or cables, where significant contrasts in the electrical properties of these targets (signal) and the surrounding soil or fill (noise) exist. Fill materials that contain metallic debris, such as steel reinforced concrete, may have similar electrical properties to the target pipe resulting in an inability to identify the possible presence of buried targets. The presence of demolition debris and foundations may mask the presence of pipes or cables located beneath or within them. The electromagnetic field surrounding overhead and buried power lines may also produce significant noise that could potentially mask the presence of buried pipes or cables.

1.2GPR SURVEY

A GSSI System 2 GPR device equipped with a 400 megahertz (MHz) transducer was used to investigate the presence of metallic and non-metallic pipes, utilities, and cables. GPR techniques are based upon the rapid and repetitive transmission of EM signals (pulses) generated from the device's transducer and propagated into the subsurface. The transmitted EM signal travels through the subsurface and is reflected at interfaces where contrasts in the dielectric permittivity (a function of electrical conductivity) of the media are present. Interfaces where GPR reflections occur include changes in soil mineralogy, soil texture, moisture content, or the presence of a buried man-made feature such as a utility, pipe, or drum. The reflected portion of the transmitted EM signal is received by the device's transducer. The two-way travel time and reflected signal amplitude versus the horizontal distance the instrument traveled are displayed on the output of the instrument.

The time it takes a GPR signal to travel from the transducer, reflect off of a target, and return to the transducer is called the two-way reflection time. Two-way reflection times are displayed in units of nano-seconds and vary depending on the electrical properties of the subsurface materials. As the subsurface material's permittivity increases, the two-way travel time increases and the velocity of the GPR signal decreases. Areas of clayey soils, fill, shales, or saline groundwater have high dielectric permittivities, relatively long two-way reflection times, and slow velocities. GPR signals in these materials also attenuate rapidly, limiting the depths of investigation. Conversely, dry sandy soils have low dielectric permittivities that result in relatively short two-way reflection times and fast GPR signal velocities. The depth of investigation is often much greater in dry sandy soils relative to clayey soils.

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Data were collected in a 25-foot radius around the boring locations along north-south and east-west trending survey lines that were spaced approximately 12.5 feet apart. Some areas required additional data coverage to further define the site features. Data were collected by dragging the transducer across the area of interest at a slow walking pace. The color display was continuously monitored during data collection so that anomalously high amplitude reflections could be delineated. Anomalies were marked with pin flags and 6-inch wooden stakes with nails and large metal washers.

1.3HIGH SENSITIVITY METAL DETECTOR SURVEY

A Geonics EM61 High Sensitivity Metal Detector meter (EM61) was used to investigate the presence of underground utilities near proposed boring locations. The EM61 is a high sensitivity, high resolution time-domain metal detector which is used to detect both ferrous and non-ferrous metallic objects. It consists of a transmitter that generates a pulsed primary magnetic field, which induces eddy currents in nearby metallic objects. Two receiver coils measure the decay of these currents. By making the measurements at a relatively long time interval after the primary pulse is transmitted, the response is practically independent of the electrical conductivity of the ground.

The EM61 data were collected in a 25-foot radius around the boring locations along north-south and east-west trending survey lines that were spaced approximately 12.5 feet apart. Some areas required additional data coverage to further define the site features. Data were collected with the instrument in automatic data collection mode. Measurements were made each second. Anomalies were marked with pin flags and 6-inch wooden stakes with nails and large metal washers.

1.4LOCATION DATA

Standard land surveying techniques were used to determine the locations of anomalies detected at the boring locations.

1.5DESCRIPTIONS OF RESULTS AT PROPOSED BORING LOCATIONS

Anomalies were determined by interpreting the combined data from the GPR and EM61 surveys.

1.5.1Proposed Boring Location B10:

This location is near the southwest corner of the site, south of the warehouse buildings. One isolated anomaly was found northwest of the proposed location and one was found to the southwest. No isolated point anomalies or linear features are within 2 ft of the staked location.

1.5.2Proposed Boring Location B11:

This location is in the south-central portion of the site. No anomalies were detected at this location.

1.5.3Proposed Boring Location B12:

This location is in the north-central portion of the site. One isolated anomaly was found south of the location. No isolated point anomalies or linear features are within 2 ft of the staked location.

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1.5.4Proposed Boring Location B13:

This location is in the southeast portion of the site. Two isolated anomalies were found east of the proposed location. No isolated point anomalies or linear features are within 2 ft of the staked location.

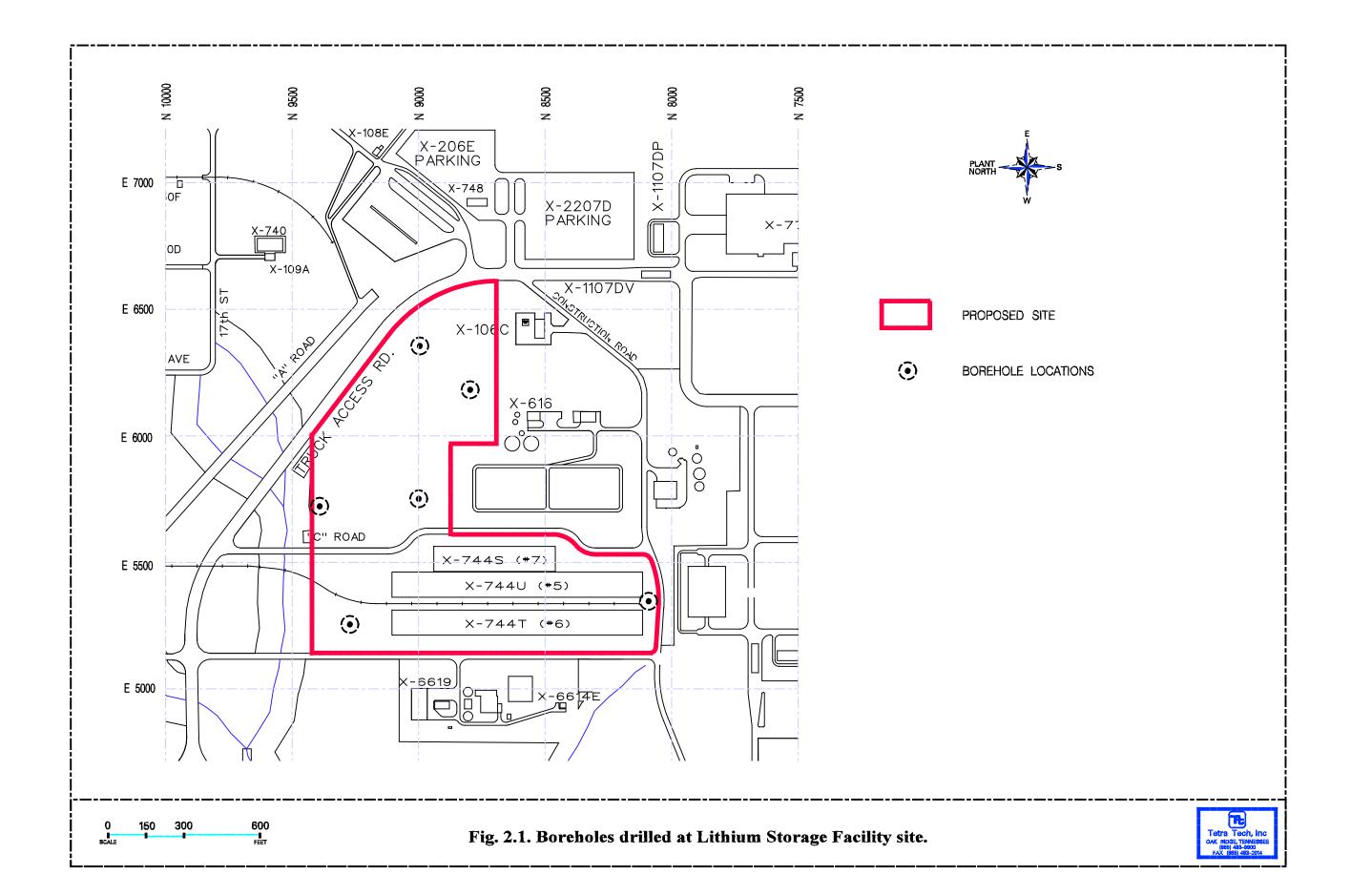
1.5.5Proposed Boring Location B14:

This location is in the northeast portion of the site. One isolated anomaly was identified northeast of the location and one was found to the south. No linear features or isolated point anomalies are within 2 ft of the staked location.

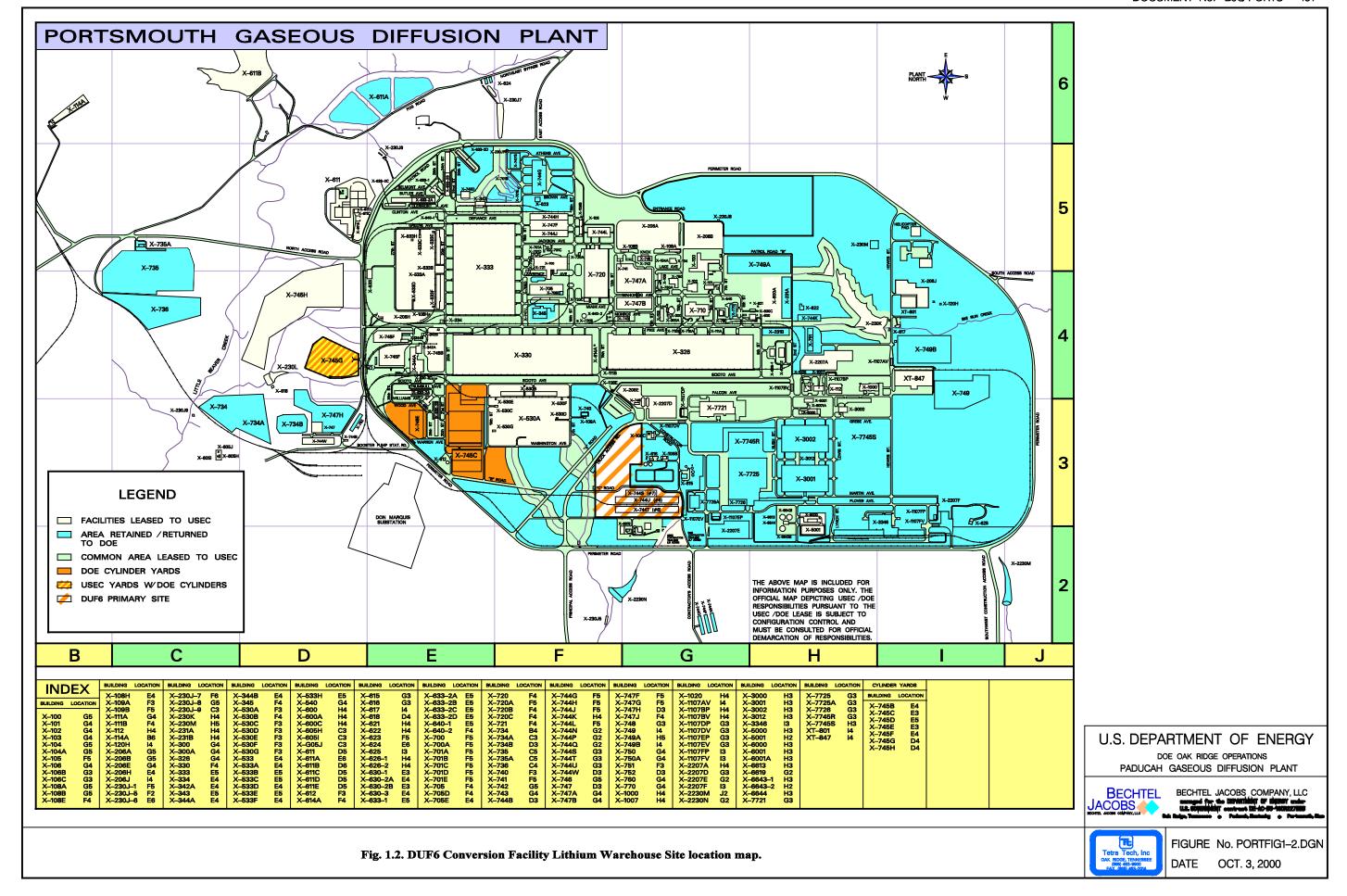
1.5.6Proposed Boring Location B15:

This location is near the northwest corner of the site, north of the warehouse buildings. One isolated anomaly was found southwest of the location. No isolated point anomalies or linear features are within 2 ft of the staked location.

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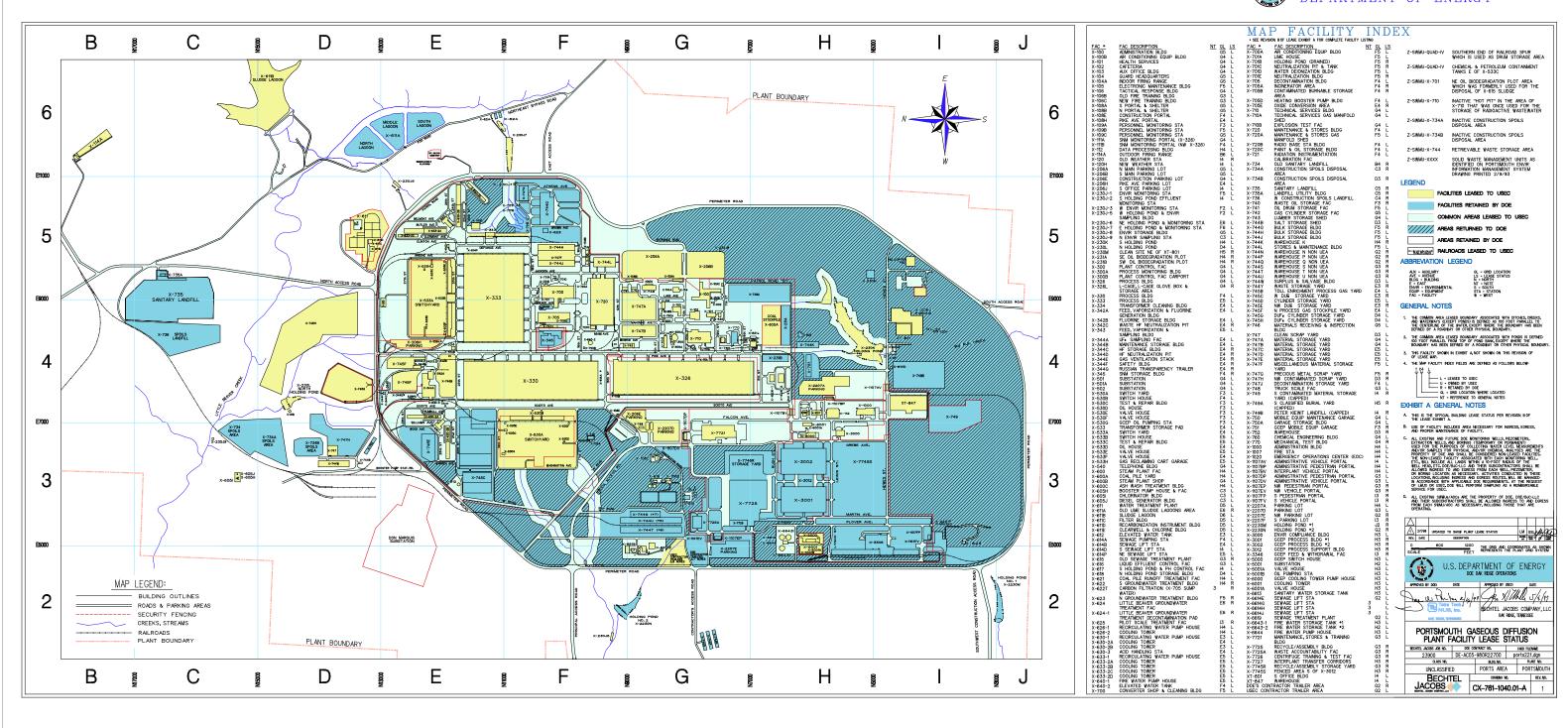


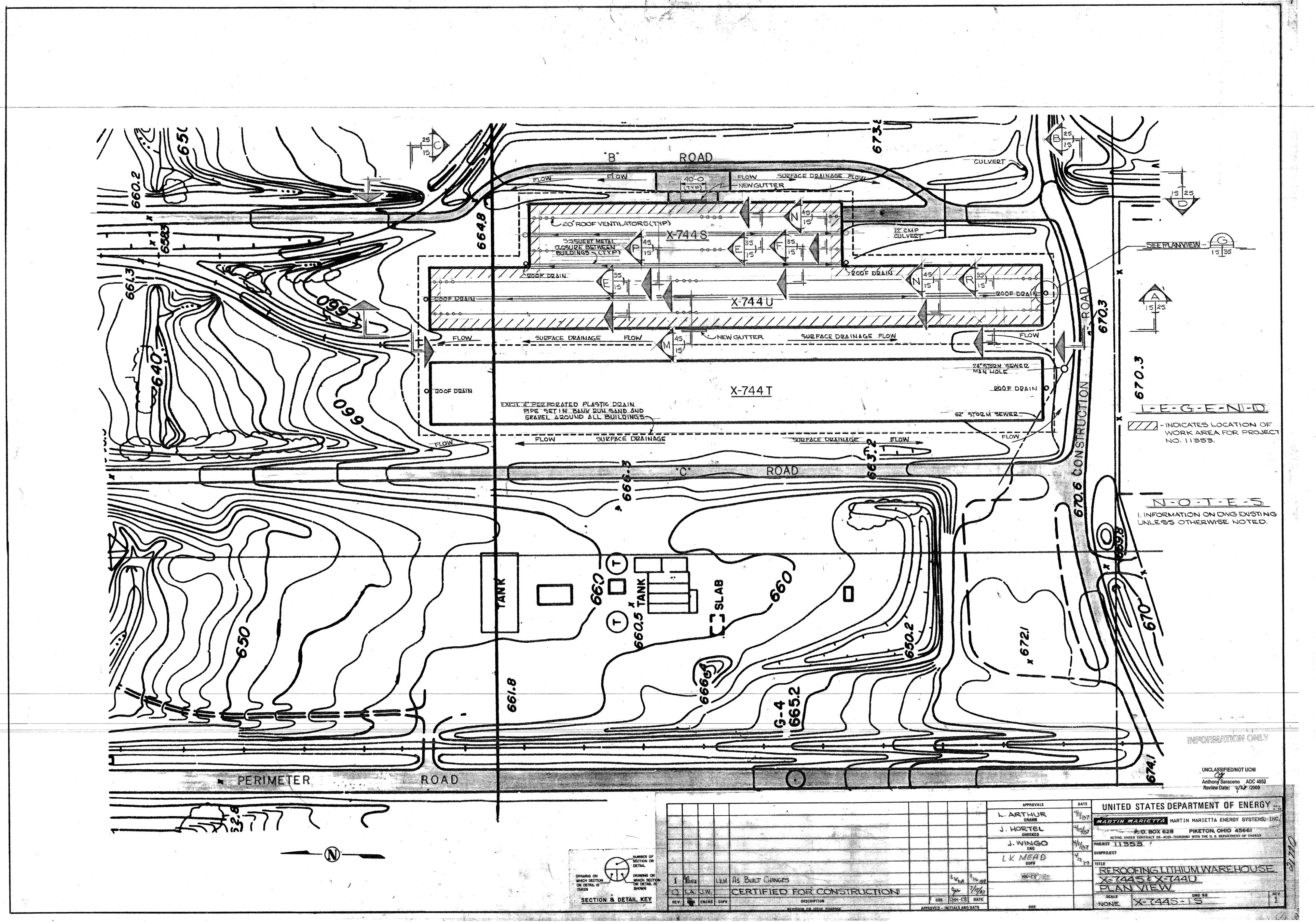
Section 3.0, Site and Topographic Mapping

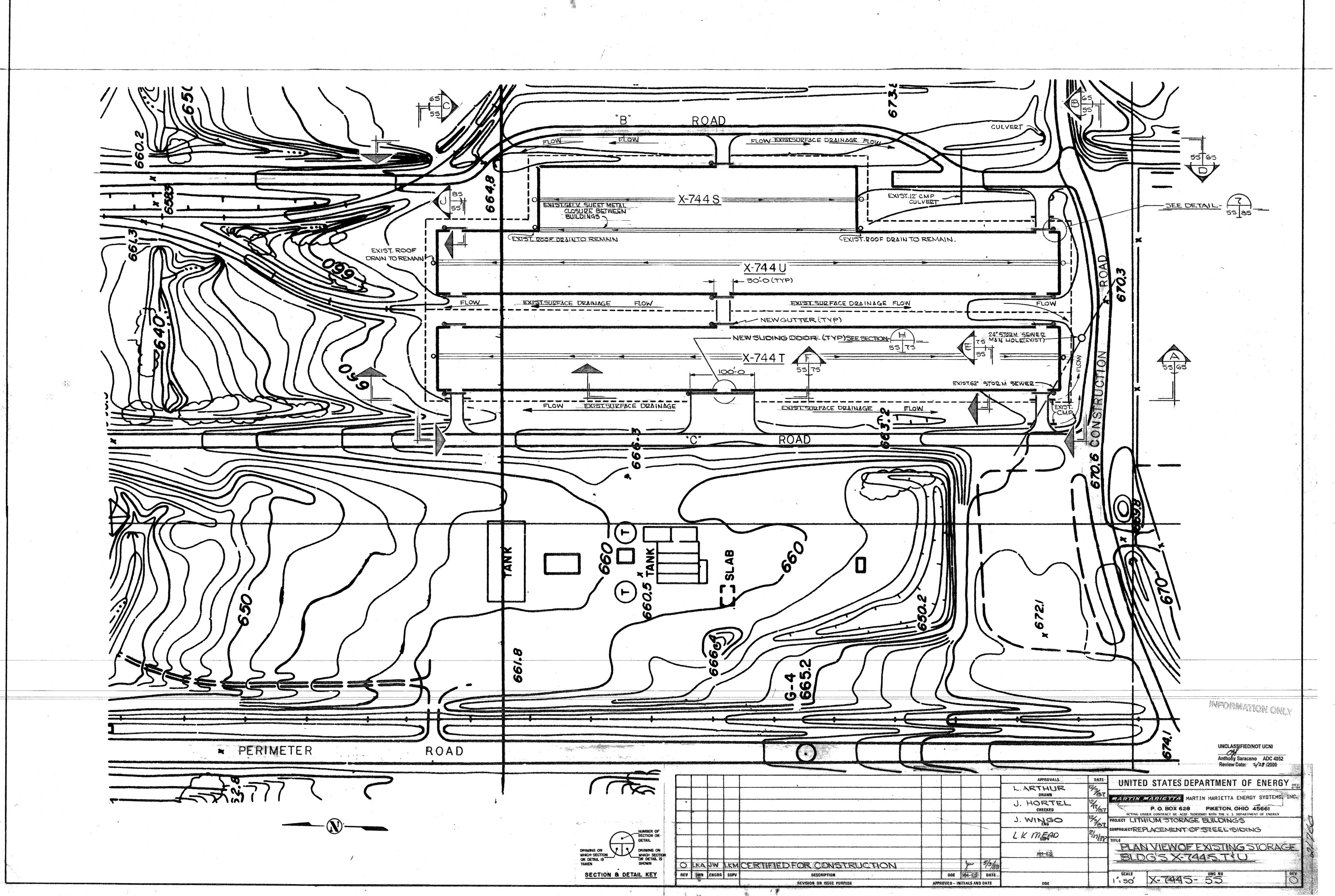


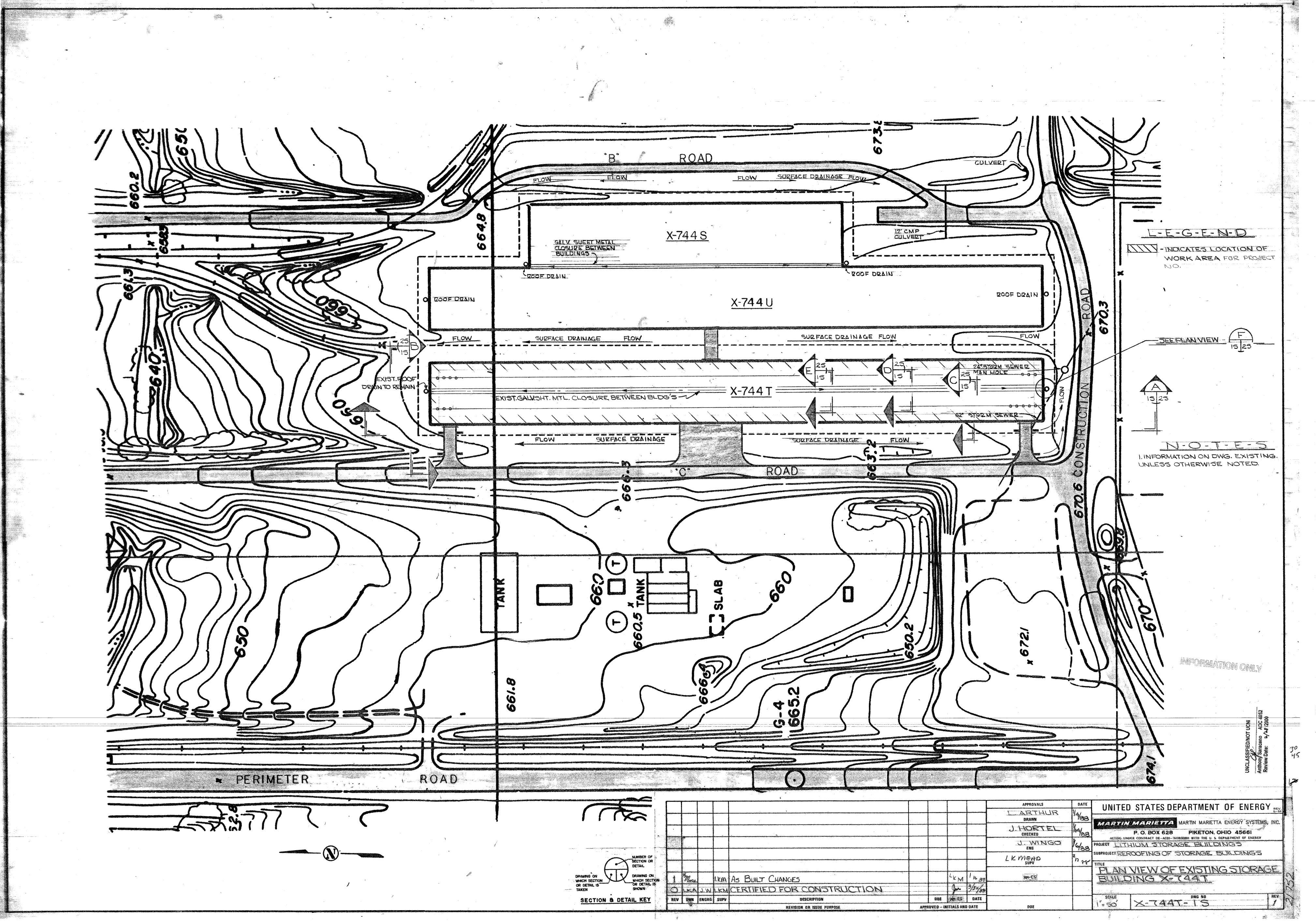
PORTSMOUTH GASEOUS DIFFUSION PLANT FACILITY LEASE STATUS











Section 4.0, Site Photographs





Aerial Looking North



Aerial Looking Northeast

Aerial Looking Northeast



Aerial Looking South



Bldg. X-744T Looking Northeast



Between X-744U & T Looking South



Between X-744U & T Looking North



X-744T Roof



Bldg. X-744U Looking Northeast



Between X-744U & T Looking North



X-744S Looking North



X-744T Roof



Interior of Bldg. X-744S



Interior of Bldg. X-744S



Interior of Bldg. X-744S



Interior of Bldg. X-744T



Inside Bldg. X-744T



Interior of Bldg. X-744T

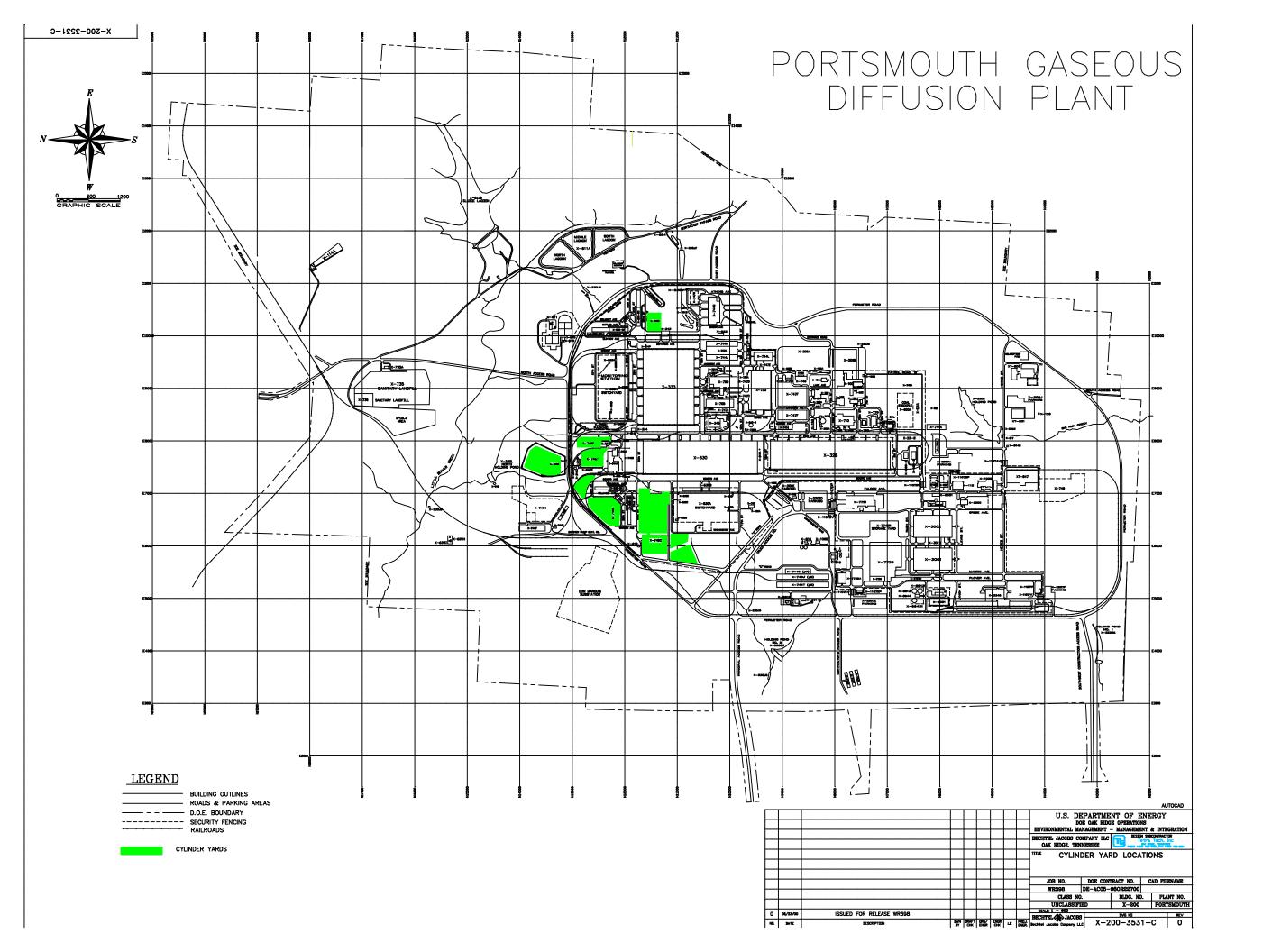


Interior of Bldg. X-744T

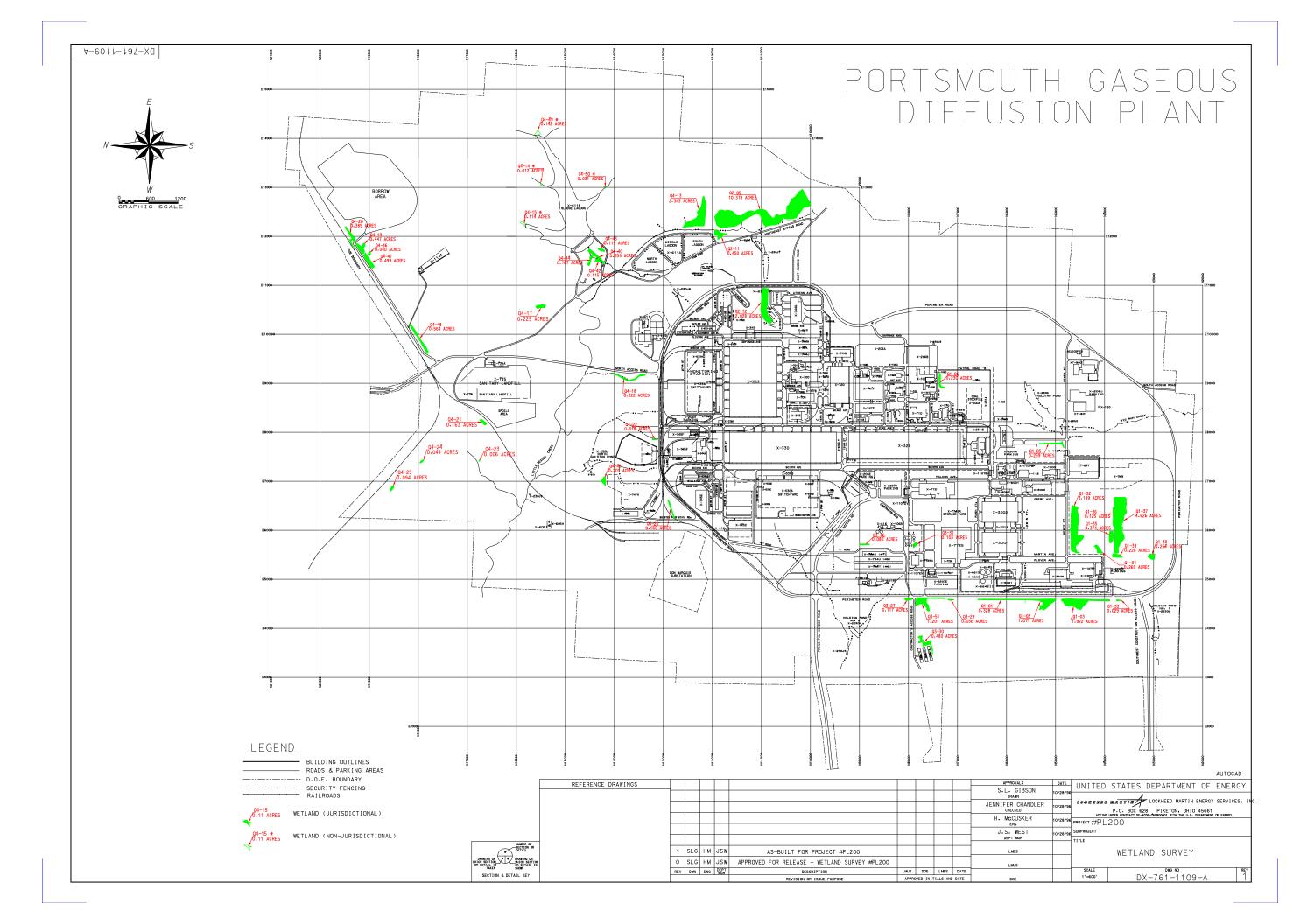


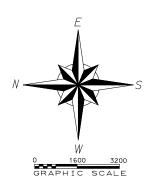
Interior of Bldg. X-744U

Section 5.0, Cylinder Yard Storage Maps

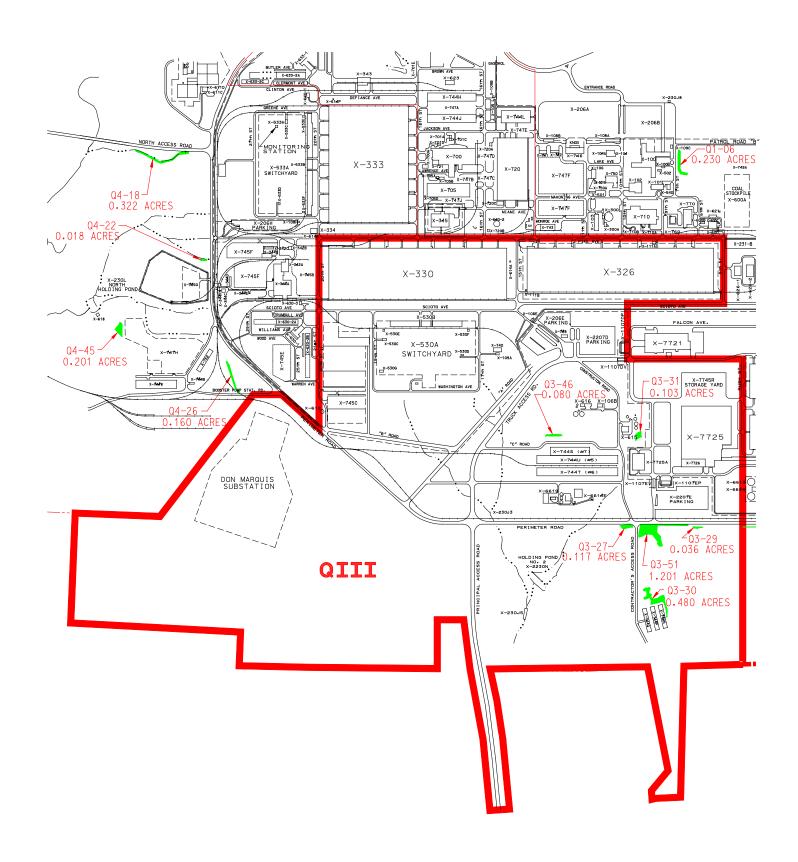


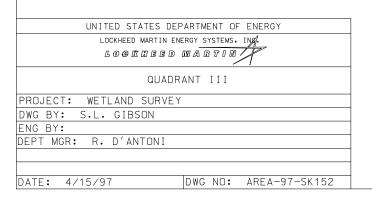
Section 6.0, Wetlands Mapping





PORTSMOUTH GASEOUS DIFFUSION PLANT





<u>LEGEND</u>

BUILDING OUTLINES
ROADS & PARKING AREAS
D.O.E. BOUNDARY
SECURITY FENCING
RAILROADS
QUADRANT BOUNDARY

04-15
WETLAND (JURISDICTIONAL)

04-15 *
WETLAND (NON-JURISDICTIONAL)